A Simple Modified Technique Umbilicoplasty

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ABSTRACT

The umbilicus is the only normal scar on the body and it is the most noticeable scar following abdominoplasty. Recreation of a natural looking umbilicus is a demanding target for many surgeons many years ago. The final shape of the umbilicus makes the difference between a pleasing result and an unsatisfactory result [1]. The authors in the study present a novel and simple technique for umbilicoplasty with a better aesthetic shape and natural appearance while maintaining the blood supply.

Patients and Methods: This study was conducted in Ain Shams University Hospitals throughout 3 years (Jan. 2010 – Dec. 2013), on 50 female patients who underwent abdominoplasty with the new technique of umbilicoplasty.

Results: No complications were recorded regarding the umbilicoplasty (sloughing or disruption). The average follow-up for all patients was one year; Aesthetic outcomes were determined by 3 independent plastic surgeons according to Strasser's grading and patients themselves.

Conclusion: The authors present a simple safe technique for umbilicoplasty with a pleasing aethetic shape.

INTRODUCTION

The umbilicus is essential to the aesthetic appearance of the abdomen; umbilicus is a term referring to the point on the abdomen at which the umbilical cord joined the fetal abdomen. It has been described as a depressed scar surrounded by a natural skin fold measuring 1.5-2cm in diameter [2]. It interrupts the linea alba in the midline at the level of iliac crest which is nearly half the distance (55%) away from the xyphi-sternal notch and to a lesser distance (45%) from the pubic symphysis. It is located at the level of the interspace of the third and the fourth lumbar vertebrae [2].

The umbilicus receives arterial inflow by means of three distinct deep sources in addition to the subdermal plexus, these deep sources are (1) The right and left deep inferior epigastric arteries that each give off several small branches and a large ascending branch, which courses between the muscle and the posterior rectus sheath passing directly to the umbilicus; (2) The ligamentum teres hepaticum; and (3) The median umbilical ligament (Fig. 1) [3].

The ideal shape of the umbilicus has been debated but recent studies have shown that the attractive abdomen tends to have a small, vertically oriented umbilicus (Fig. 2) [4].

Many techniques have been posted to restore the shape of the umbilicus with abdominoplasty procedures, many of which do not give the final aesthetic and natural appearance of the umbilicus in relation to the whole abdomen.

This paper presents a new technique for umbilicoplasty during abdominoplasty; this technique gives better aesthetic shape and natural appearance of the umbilicus with preserving its blood supply.

PATIENTS AND METHODS

This study was conducted in Ain Shams University Hospitals throughout 3years from Jan. 2010-Dec. 2013. Fifty patients were included, their age was ranging from 26-60 years old whom had abdominoplasty (high lateral tension technique) [5] combined with liposuction if needed.

Informed consents from all patients were obtained, in addition to permissions for preoperative and postoperative photos (front and dead lateral view from both sides) for all patients.

The patients selected were fit for the surgery according to clinical examination and pre-operative laboratory investigation results. All selected patients did not have para umbilical hernia.

Intra-operative markings:

The vertical midline was used as a reference for the new position of the umbilicus, the new position of the umbilicus is determined after the excision of the lower abdominal flap, this can be done by various methods, the authors used the palpation of the umbilicus bimanual and confirmed by the measurements and the level of the iliac crest. A vertically oriented oval shape drawn usually not wider than 1.5cm and not longer than 2.5cm 12 at the determined position, these dimensions may be decreased for smaller patients to maintains proportions according to the surgeon's aesthetic judgment [6].

Operative technique:

The umbilicus was excised from the abdominal flap leaving a rim of skin around the umbilicus, then careful dissection and defattening of the umbilicus from the abdominal flap was performed.

The rectus muscle plication using prolene (0) sutures was done from xiphoid process to umbilicus and from umbilicus to symphesis pubis as usual in two layers.

Then the umbilicus was fixed to the rectus sheath by 2 inverted sutures from its upper and lower poles (6, 12 o'clock) leaving 0.5cm below the edge of the umbilicus to the rectus sheath; then transfixing the umbilicus by transverse transfixion suture. The transfixion suture starts 0.5-1cm of one edge of the sheath then pass through the umbilicus continuing through to the other edge then returns back through the umbilicus again to the starting point and tied (Figs. 3,4).

After the excision of the lower part of the abdominal flap, determination of the site of the umbilicus over the skin of the abdomen (by the methods mentioned before in the preoperative markings) and designing a vertical oval shaped incision in the midline measuring 2.5cm in a vertical length and 1.5cm in the transverse length.

Incising the abdomen at the designed site then dissection and excision of this part and underlying fat, then dragging of the umbilicus to its new position and fixing it with monocryl 2/0 of the subcutaneous layer and closure of the skin with 4/0 burried intradermal stitches thus obviating the ugly scar left after simple interrupted sutures that were commonly used previously.

After completion of all skin closure, dressing of the umbilicus with inserting vaseline gauze in the form of bolster inside the umbilicus with antibiotic ointment over the edges, thus sealing any breaches to keep the negative pressure of the redivac. In cases of long stalk or deep umbilicus, the stalk was buried intra abdominal leaving a short stalk (about 3-5cm), then applying the sutures of the new technique for the short stalk.

Postoperative evaluation:

All patients were assessed clinically after 3 and 6 months for aesthetic results by photography. Objective aesthetic evaluation was performed by using the grading system as described by Strasser's grading [7] for scoring of the postoperative photographs and the photographs made at the long-term follow-up.

The scoring was performed by three plastic surgeons; criteria used were position, shape, symmetry, contour deformity and scars (perfect = 0 points, noticeable = 1 point, obvious = 5 points and obvious and deforming = 15 points). The total score equals the sum of the scores for each of the five points. A total score of zero points represents an excellent result, a score from 1 to 4 points a good result and a score from 5 to 14 points a mediocre result. A total score of 15 points or higher is considered to be a poor result [7].

To assess the patients' satisfaction, they were subjected to a questionnaire with five items which were the overall result, shape, size, position of the umbilicus, and the scar. The scale options were 0 (poor), 1 (fair), and 2 (good), and the total rate can range from 0 to 10.

RESULTS

Fifty patients were included in the study, none of the patients' required intraoperative or postoperative transfusions and the median hospital stay was one to three days depending on the rate of patient recovery time and amount of the fluid in the drainage portovac. All patients underwent a full abdominoplasty, with liposuction of the all abdominal area. The average preoperative body mass index was 26.4. The most common co- morbidity was obesity. The average follow-up for all patients was one year. The final shape of the abdomen showed a smooth shaped abdomen and well defined waist simulating an hour glass, which was aesthetically preferable for all the patients.

In the early postoperative period, four patients (8% of cases) experienced bluish discoloration of the umbilicus; the condition was treated conservatively by daily dressing with ointment and passed without morbidity. No patients required surgical revisions.



Fig. (1): Diagram showing the blood supply to the umbilicus.



Fig. (2): Umbilical shapes and their frequency of occurrence [4].



(A)



(B)



(C)

Fig. (3): Photos showing the technique of the authors. Photos from (A-C): Showing the steps of the transfixion suture of the umbilicus.

(1)(A) (2)

(B)

Fig. (4): Transfixion suture of the technique. (A,B) Transfixition suture of the umbilicus.

Regarding the subjective assessment of the aesthetic results by Strasser's grading, the results are presented in Table (1) and Fig. (5), after 3 months follow-up, 70% of patients had good grade, 24% had mediocre grade, 6% had poor results and 0% had excellent results, while after 6 months follow up, 82% of patients had good results, 12% had mediocre results, 6% had poor results and 0% of patients had excellent results.

Patient's satisfaction was evaluated by a questionnaire given to the patients in the follow-up visits to evaluate the results, shape and satisfaction (Figs. 6,7). All patients were pleased with the shape of the vertically oriented depressed umbilicus and the overall shape of the abdomen except in 4 patients (8%).

Table (1): Subjective assessment of the aesthetic results by Strasser's evaluation.

Strasser's grade	3 months follow-up	6 months follow-up
Excellent (0 points)	0	0
Good (1-4 points)	35 patients (70%)	41 patients (82%)
Mediocre (5-14 points)	12 patients (24%)	6 patients (12%)
Poor (>15 points)	3 patients (6%)	3 patients (6%)







Fig. (6): Patient's satisfaction.

A- Preoperative photo showing the shape of the umbilicus.

Case (2):

Case (1):



A- Preoperative photo showing the shape of the umbilicus.





A- Preoperative photo showing the shape of the umbilicus.

B- Postoperative photo showing the shape of the umbilicus.



B- Postoperative photo showing the shape of the umbilicus.



B- Postoperative photo showing the shape of the umbilicus.



Fig. (7)

DISCUSSION

Umbilical repositioning is a main step during abdominoplasty. Surgeons aim to perform the operations ending up with minimal visible scars and a natural-looking abdomen [8]. Some studies showed evidence of scar or retraction with umbilical stenosis may occur [9].

Different shapes have been described, oval, T-shaped, rounded, transversely oriented or distorted [10], may be hooded or not. The umbilicus may be inverted showing a deep crater in obese patients, or shallow with its base level at the surface in thinner individuals [11]. It is generally flat and vertical in young individuals and later develops hooding and deepening of the stalk as fat accumulates along the deep fat pocket surrounds the umbilicus [12].

The ideal shape of the umbilicus has been debated, several studies done showed that the attractive abdomen tends to have a small vertically oriented umbilicus [4], and there is a tendency for variation of the umbilicus with age, after childbirth usually the umbilicus has a transverse orientation, however aging in contribution with weight gain will contribute to further changes [2]. In a study done among Egyptian population, found that the most common shape of umbilicus is the rounded shape followed by the vertical slit [13].

Craig et al., [2], showed in his study that the most common shape was T-shaped followd by oval, vertical, transverse and distorted shapes respictively, also they found that the most aesthetically pleasing umbilicus is small in size T or vertical in shape with superior hood or shelf.

Other techniques were described as the use of Y or double-Y cutaneous incisions has improved aesthetic results [14,15], but both of them didn't give the best result, also, Tallaj and Gervisa [16] presented a rectangular technique for umbilical restoration which was not satisfactory for the surgeon and patients, umbilcal herniation was a common complication with the previous techniques also, none of them were completely satisfactory to the best outcome in all patients.

The technique presented in the current study depends on that the umbilicus receives its blood supply from three different ways; (1) Right and left deep inferior epigastric arteries that each give off several small branches and a large ascending branch, which courses between the muscle and the posterior rectus sheath passing directly to the umbilicus; (2) The ligamentum teres hepaticum; and (3) The median umbilical ligament [3], this arrangement of the blood supply leads to low incidence of jeopardizing the umbilical blood supply.

Using transfixtion suture leads to good fixing of the umbilicus to the rectus sheath, preventing the herniation of the umbilicus, limiting the length of the umbilicus and controls the traction of the umbilicus to the abdomen in addition to the skin cut in a vertical fashion leads to small vertically orientated umbilicus which is more preferable by the patients and documented by the studies in addition to the hidden scar of the umbilicus, four patients experienced bluish discoloration of the umbilicus which treated conservatively, this discoloration due to compression of blood supply and improved shortly within a week.

As regard the aesthetic results according to surgeon's evaluation after 6 months follow-up, 41 patients had good results, 6 patients had mediocre results and only 3 patients had poor results, and according to the patient's evaluation, forty six patients were satisfied (92%) and only four patients were not satisfied (8%).

Finally, the authors recommend the presented technique as regard the safety, simplicity, low complication rate, and has a very good outcome.

Conclusion:

In the current study, the authors present a technique for umbilical restoration which gives better aesthetic shape for the umbilicus with slightly hidden scar.

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